

**Comments and Recommendations**  
**RM 10.9 TCRA Final Design – Cap and Long Term Monitoring Plan**

**I. Comments on Long Term Monitoring Plan**

As we discussed, EPA has consulted with experts in the field of active cap design and monitoring to develop the broad outlines of what an implementable plan that provides good, usable data should look like. The following are our recommendations, which we would like to discuss with you next week:

- a. Goal: Determine if contaminants under the cap are migrating upwards, so as to monitor the long-term performance of the cap.
- b. Approach: Use vertical Solid-Phase Micro-Extraction (SPME) passive samplers to monitor pore water within the cap and at the sediment-surface water interface of the cap. The samplers should be extended through the cap, to at least 6 inches below the expected cap bottom. The fibers can be placed either discretely and/or over longer sections to monitor specific zones of the cap.
- c. Design: Our current recommendation does not require any modification to the existing cap design. A few weeks after placement of the cap is complete (to allow time for the cap to settle), tubes, or other appropriate devices to allow access to the sample matrix within the cap, can be installed through the cap by moving aside the armor layer and replacing it after installation. These devices can then be used to insert the SPME sampler, and thus can allow for long-term monitoring of the cap. For security purposes, the devices should include a locking mechanism. For the monitoring at the sediment-surface water interface, samples can be taken using the same SPME apparatus as described above, or with a separate configuration.

Measurements should be taken, at a minimum, at the cap's interface with the existing sediment, at the top of the active layer and at the armor layer/surface water interface.

- d. Other requirements: Sediment samples must be collected prior to placement of the cap and then the top sand layer should be sampled during the monitoring period, concurrent with the pore water sampling.
- e. Additional issues/questions to discuss:

- i. The density and frequency of sampling needs to be determined.
- ii. Ambient water quality conditions of the sediment pore water and surface water will be well established by the end of the removal action. Pore water and sediment-surface water interface concentrations that are collected during the monitoring program can be compared to those ambient conditions to determine if there are changes such as increases which may indicate breakthrough, or decreases which may demonstrate that the cap is performing as expected. This is a performance-based monitoring plan.

II. Comments on Supplement to Final Design Report - Overview of Numerical Modeling Supporting the Design of the Active Layer in the River Mile 10.9 Engineered Sediment Cap

1. The CapSim model was run with DOM = 0. The design team should demonstrate that it makes no difference to the conclusions to allow for a higher (more realistic) concentration of DOM, i.e. that the amount of activated carbon specified is sufficient to strip the contaminant off of DOM before it can migrate out of the reactive cap. This may be the case, but it is not currently demonstrated, or otherwise accounted for.

In addition, please provide clarification on the expectations/assumptions used for sorption kinetics of any DOM-associated organic contaminants as they are carried through the cap (presumably upward toward the surface water).

2. The design includes the use of AquaGate, a proprietary product that appears to consist of an aggregate core, bentonite, and activated carbon (at least as one variant of the product). There is little information available on the supplier's website about the composition of AquaGate or its demonstrated performance in applications like the one proposed – such as how readily it mixes with sand, its effectiveness in sequestering contaminants, its permeability, etc. Please provide some additional information and a couple of case studies to help answer these questions.
3. Please compare the measured in-situ seepage velocity against a seepage velocity calculated using a laboratory hydraulic conductivity and assumed gradient, to assess any tidal effects.
4. As a point of clarification, based on sediment characterization data, the NJDEP team determined that the pore water collection method utilized would yield “representative” pore water data, not necessarily biased high, as represented in the cap design supplemental technical memorandum dated May 9, 2013. The pore water samples were comprised of composites from across the mudflat, with collection points selectively chosen based on the higher sediment levels for the COPCs at the target depth

of 2 – 4 ft., to represent the new surface to be directly beneath the cap. However, widespread elevated contaminant concentrations exist at that depth.

5. Clarification is needed on the stability of the capped region relative to the adjacent river channel to ensure there is not excessive pressure for side-slope failure along the full vertical face of the western boundary of the removal area. (Section 4.2 appears to address upper side slope stability for the top several feet of the mudflat where dredging will take place.
6. We had previously discussed placing sand over the northern extension of the removal area, where capping will not take place, but this is not included in the design plans. Please address. In addition, consider placement of sand over the no-dredge zone, if possible.

### III. Comments on Section 7 of the Final Design Report

7. Section 7.2.2, Chemical Containment – The documents states that to create more favorable conditions for adsorption and isolation of COPCs, activated carbon will be mixed with sand rather than being placed as a separate layer. Please provide more information to support this statement.
8. Section 7.2.3, Cap Armoring –
  - a. This section states that, at EPA's request, the impact of a more intense (500-year) storm event was evaluated. However, the outcome of that evaluation is not presented. This information should be included in this section, along with any resulting changes in design that this information may have prompted.
  - b. The design documents should describe the thickness of the cover sand over the armor layer, its intended purpose (flood control, habitat re-establishment, etc.) and how the designated thickness meets these goals.
9. Figure 7-5 depicts smooth stone in the armored layer. Please clarify if angular or smooth stone is to be used and the reasons selected.
10. Section 7.8.1, top of page 7-11 – This section discusses a Reactive Core Mat, SediMite and AquaGate. The selected product should be specified.